

## 2004 GEODETIC CONTROL PROJECT

### Report of Project:

Bledsoe Tapp and Riggert, Inc. was contracted in 2004 to conduct a control survey to provide State Plane Coordinates on newly established and existing points throughout Monroe County. The principal goal of this project was to determine State Plane Coordinates on Public Land Survey System corners. To develop an accurate control network this project was completed in two phases. Phase 1 of the project was establishing an accurate network of new monuments to act as the primary control for the future densification. Phase 2 of the project was utilizing the local control network created during Phase 1 to determine the State Plane Coordinates of existing Public Land Survey System corners.

Phase 1 established a network of twenty points distributed evenly throughout Monroe County. These points were primarily 30-inch long aluminum survey markers with an attached magnet placed in locations suitable for GPS observation. The controlling monuments used in the adjustment of the Phase 1 network included the HARN station located at the Grissom Municipal Airport in Lawrence County (V 281), the HARN station located at the old I.U. Skeet Range in Bloomington (BLOOMINGTON NCMN 7291), and the HARN station located 4 miles South of Martinsville along State Road 67 in Morgan County (N 13). The Indiana University Continuously Operated Reference Station in Bloomington (INDIANA UNIVERSITY CORS L1 PHASE CENTER) was also verified and accepted for use as a primary control point for this project. The Indiana High Accuracy Reference Network (HARN) stations were held fixed in the Phase 1 adjustment.

The GPS observation for this project were made with four Topcon dual-frequency receivers. All raw data was processed and adjusted using Pinnacle Post-Processing Software. All of the stations in the Phase 1 network were occupied a minimum of two times and occupation sessions were in excess of two hours per point. The minimum positional accuracy for this project was 1:100000 (10ppm). A much higher degree of accuracy was achieved throughout this project. The probable horizontal error associated with the Phase 1 control is less than 0.1'. The probable vertical error associated with the Phase 1 control is less than 0.2'. All of the data published as part of the project is referenced to NAD83 U.S. survey feet, and NAVD88.

The second phase of this project utilized the Phase 1 control point in the establishment of State Plane Coordinates on existing Public Land Survey System corners. Existing corners were recovered throughout the county and tied to State Plane Coordinates. An effort was made to evenly distribute the points throughout the county. In some parts of the county this was difficult due to the availability of corners with good sky visibility. The Phase 2 points were adjusted to the Phase 1 control points.